INTERACTIONS OF HUMAN UMBILICAL VEIN ENDOTHELIAL CELLS WITH TOBACCO TREATED STREPTOCOCCUS MUTANS

Vinayak Gupta[1] , L. Jack Windsor[1], Fengyu Song[1], and Richard Gregory[1]

Streptococcus mutans (*S. mutans*) is a major contributor to dental caries. Previous research has shown that there is a positive relationship between smoking and dental carries, however the pathway of *S. mutans* growth is not yet understood. Tobacco use affects the cardiovascular system and increases the rate of cardiovascular disease among smokers. However, the effects of tobacco on the endothelial cells that line blood vessels are not yet fully understood. Thus, the objective of this study was to examine some of the effects that a periodontal pathogen such as *S. mutans* treated with cigarette smoke condensate (CSC) and nicotine have on human umbilical vein endothelial cells (HUVEC's). The *S. mutans* was grown at 37°C and then the planktonic cells were harvested, washed with saline, and then killed with formaldehyde. To standardize the samples, they were diluted to the same OD at 600nm wavelength using a spectroscope. The HUVEC were cultured in Endothelial Basal Medium-2 and plated in 12 well plates and exposed to the *P. gingivalis* cells and supernatants and after 72 hours, lactate dehydrogenase (LDH) assays will be used to cytotoxicity. Non-toxic amounts of the cells and supernatants will then be used to treat HUVEC cells for 72 hours before the media is collected and analyzed for cytokine/growth factor expression by protein arrays. Second messenger signaling pathways will be analyzed with ERK and JNK antagonists and agonists to determine the pathway of up regulation of *S. mutans.* A better understanding of the detrimental effects that tobacco has on the underlining causes of periodontal disease can advance the quest of controlling the disease.

This study was funded by the Indiana University-Purdue University Indianapolis Multidisciplinary Undergraduate Research Institute (MURI).

Mentors: L. Jack Windsor, Department of Dental Oral Biology, IU School of Dentistry, Fengyu Song, Department of Dental Oral Biology, IU School of Dentistry and Richard Gregory, Department of Dental Oral Biology, IU School of Dentistry

Department of Dental Oral Biology & Richard Gregory, Department of Oral Biology), Indiana University School of Dentistry, Indianapolis, IN 46202